

Chapter 9 Cellular Respiration**Chapter Test A****Multiple Choice**

Write the letter that best answers the question or completes the statement on the line provided.

- _____ 1. Which of the following is NOT a stage of cellular respiration?
a. fermentation c. glycolysis
b. electron transport d. Krebs cycle
- _____ 2. What are the reactants in the equation for cellular respiration?
a. oxygen and lactic acid
b. carbon dioxide and water
c. glucose and oxygen
d. water and glucose
- _____ 3. The starting molecule for glycolysis is
a. ADP. c. citric acid.
b. pyruvic acid. d. glucose.
- _____ 4. One cause of muscle soreness is
a. alcoholic fermentation.
b. glycolysis.
c. lactic acid fermentation.
d. the Krebs cycle.
- _____ 5. Which process is used to produce beer and wine?
a. lactic acid fermentation
b. glycolysis
c. alcoholic fermentation
d. the Krebs cycle
- _____ 6. The conversion of pyruvic acid into lactic acid requires
a. alcohol. c. ATP.
b. oxygen. d. NADH.
- _____ 7. Which organism is NOT likely to carry out cellular respiration?
a. tree c. anaerobic bacterium
b. mushroom d. tiger
- _____ 8. During one turn, the Krebs cycle produces
a. oxygen. c. electron carriers.
b. lactic acid. d. glucose.
- _____ 9. Which of the following passes high-energy electrons into the electron transport chain?
a. NADH and FADH₂ c. citric acid
b. ATP and ADP d. acetyl-CoA

- ____ 10. Cellular respiration uses one molecule of glucose to produce
- 2 ATP molecules.
 - 34 ATP molecules.
 - 36 ATP molecules.
 - 38 ATP molecules.
- ____ 11. Breathing heavily after running a race is your body's way of
- making more citric acid.
 - repaying an oxygen debt.
 - restarting glycolysis.
 - recharging the electron transport chain.
- ____ 12. All of the following are sources of energy during exercise EXCEPT
- stored ATP.
 - alcoholic fermentation.
 - lactic acid fermentation.
 - cellular respiration.
- ____ 13. Which process does NOT release energy from glucose?
- glycolysis
 - photosynthesis
 - fermentation
 - cellular respiration
- ____ 14. Photosynthesis is to chloroplasts as cellular respiration is to
- chloroplasts.
 - cytoplasm.
 - mitochondria.
 - nucleus.
- ____ 15. Plants cannot release energy from glucose using
- glycolysis.
 - photosynthesis.
 - the Krebs cycle.
 - cellular respiration.

Completion

Complete each statement on the line provided.

16. Cellular respiration occurs only in the presence of _____.
17. Without oxygen, a cell can extract a net gain of only _____ molecules of ATP from each glucose molecule.
18. The pathway labeled B in Figure 1 is called _____ fermentation.
19. In Figure 1, only the pathway labeled _____ requires oxygen.
20. A high level of lactic acid in the blood is a sign that _____ fermentation has occurred.

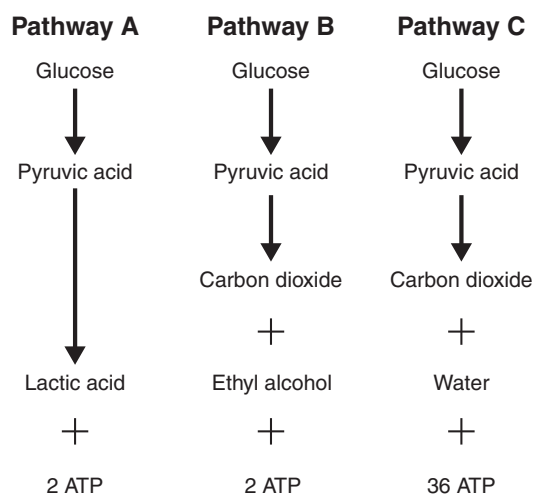


Figure 1

Short Answer

In complete sentences, write the answers to the questions on the lines provided.

21. List the three main stages of cellular respiration in order. Where does each stage take place in the cell?

22. What are the two types of fermentation? How do their products differ?

23. Based on Figure 2, which type of fermentation does NOT give off carbon dioxide? Explain your answer.

24. What role does oxygen play in the electron transport chain?

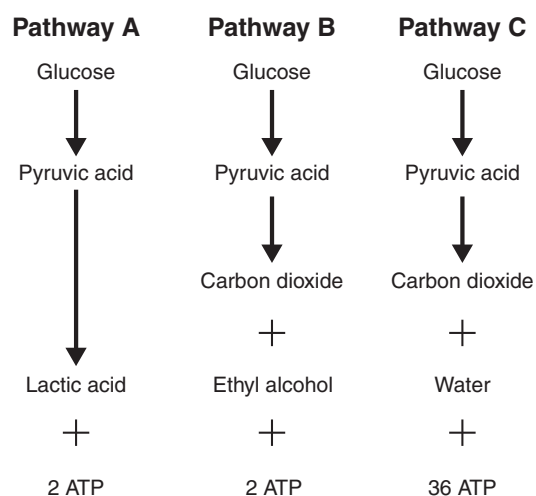


Figure 2

25. What three sources of ATP does your body use during a long aerobic exercise session?

Using Science Skills

Use the diagram on the next page to answer the following questions on the lines provided.

A scientist set up a respiration chamber as shown in Figure 3. She placed a mouse in flask B. Into flasks A, C, and D, she poured distilled water mixed with the acid-base indicator phenolphthalein. In the presence of CO₂, phenolphthalein turns from pink to clear. She allowed the mouse to stay in the chamber for about an hour.

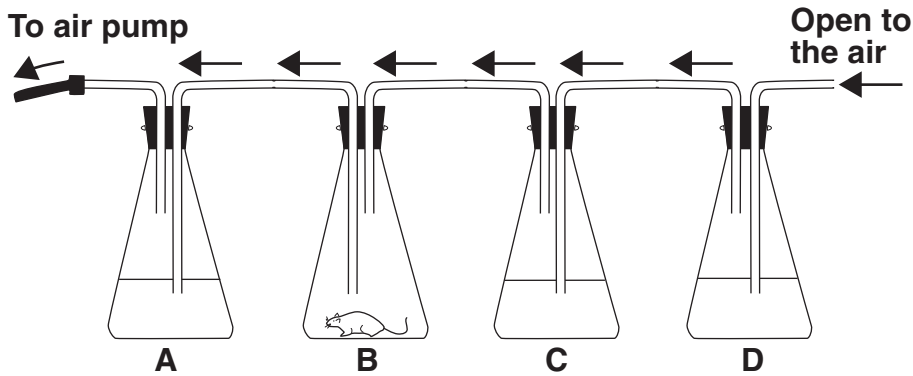


Figure 3

- 26. Inferring** Write the equation for cellular respiration. Based on this equation and the setup shown in Figure 3, what substance(s) would you expect the mouse in flask B to give off?

- 27. Interpreting Graphics** What will the mouse require to carry out cellular respiration? Describe the flow of materials through the flasks in Figure 3. Will the mouse receive fresh air so that it can survive?

- 28. Interpreting Graphics** Based on Figure 3, how will the scientist be able to detect whether the mouse is carrying out cellular respiration?

- 29. Applying Concepts** Assume that the scientist set up an identical respiration chamber, except that in this setup she placed a cricket in flask B instead of a mouse. At the end of one hour, she measured the amount of CO_2 given off by the cricket and the mouse. A small amount of CO_2 had been given off by the mouse, but little to no CO_2 had been given off by the cricket. Is the cricket undergoing cellular respiration? Explain these results.

- 30. Predicting** Assume that the scientist set up an identical respiration chamber, except that in this setup she placed a mouse that had been exercising on a hamster wheel. Then, the scientist measured the amount of CO_2 given off by both mice at the end of 15 minutes. Predict which setup produced the most CO_2 . Explain your answer.

Essay

Write the answer to each question in the space provided.

- 31.** List the main events of glycolysis. How many ATP molecules are produced and consumed by glycolysis? What effect does the presence of oxygen have on the events that follow glycolysis?

- 32.** Compare lactic acid fermentation with alcoholic fermentation. Where does each process occur? What are the products of each process?

33. Identify the electron carriers of cellular respiration. Discuss the relationship between the electron carriers and the electron transport chain.

34. Explain how high-energy electrons are used by the electron transport chain.

35. Which pathways does the body use to release energy during exercise? Discuss these pathways in terms of a footrace.